

METHOD AND APPARATUS FOR ADAPTIVE CHANNEL EQUALIZATION USING DECISION FEEDBACK

ABSTRACT OF THE DISCLOSURE

Adaptive chip-based equalizers are considered for the mobile receiver of CDMA communication systems as a low complexity solution that is capable of removing multipath interference and improving performance relative to the conventional Rake receiver. The performance of adaptive equalizers is critically impacted by the mobile's speed which is directly related to the update size of the equalizer's weights and the associated adaptation coefficient value. This has been recognized in the art and the selection of the adaptation coefficient value is based on the mobile speed. The disclosed invention proposes a novel method for selecting the adaptation coefficient that is based on the signal-to-noise ratio (SNR), as measured at the receiver, in addition to the mobile speed. In that manner, the adaptation coefficient becomes a function of two parameters. The motivation for making the adaptation coefficient dependent on the SNR stems from the fact that for large SNR values, equalization is accurate and faster adaptation can be supported while the opposite is true for low SNR values. Exploiting this fact allows the equalizer to improve channel tracking and offer better performance. The complexity of a receiver employing an adaptive equalizer and the disclosed invention is not increased since the receiver already measures the SNR in support of other functions.